

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)

## PATENT APPLICATION

AMENDMENT UNDER 37 C.F.R. § 1.111

U.S. Application No. 10/784,771

RECEIVED  
CENTRAL FAX CENTER

JUL 31 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

## LISTING OF CLAIMS:

1-4. (*Canceled*)5. (*Currently Amended*) ~~The~~ An optical inspection system as set forth in claim 1,comprising:a light source outputting an annular beam;an objective lens focusing the annular beam at a target;a detector receiving light scattered from the target, through the objective lens; and

wherein:

the detector receives the scattered light, as dark field detection, through a portion of the objective lens corresponding to an inner part of the annular beam; and

the detector simultaneously receives light reflected from the target, as bright field detection, through a portion of the objective lens corresponding to an outer part of the annular beam.

6. (*Currently Amended*) ~~The~~ An optical inspection system as set forth in claim 1, further comprising:

a light source outputting an annular beam;an objective lens focusing the annular beam at a target;

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)

**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111

U.S. Application No. 10/784,771

a detector receiving light scattered from the target, through the objective lens;

a scanner scanning the annular beam along a line in a given scanning direction to provide a scanned single annular beam; and

a multiple beam splitter producing multiple annular beams of substantially identical intensity from the scanned single annular beam.

7. (Original) The optical inspection system as set forth in claim 6, wherein:

the detector receives the scattered light, as dark field detection, through a portion of the objective lens corresponding to an inner part of each of the annular beams; and

the detector simultaneously receives light reflected from the target, as bright field detection, through a portion of the objective lens corresponding to an outer part of each of the annular beams.

8. (Original) The optical inspection system as set forth in claim 6, wherein the detector is a multiple line CCD camera, and wherein each of the multiple annular beams is imaged on a separate one of the lines of the multiple line CCD camera.

9. (Original) An optical inspection system, comprising:

a light source outputting a single beam;

a scanner scanning the single beam along a line in a given scanning direction to provide a scanned single beam; and

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)  
**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/784,771

a multiple beam splitter producing multiple beams of substantially identical intensity from the scanned single beam.

10. *(Original)* The optical inspection system as set forth in claim 9, wherein the multiple beam splitter produces the multiple beams with a diffractive optical element having uniform diffraction efficiency.

11. *(Original)* The optical inspection system as set forth in claim 10, wherein the diffractive optical element is a Dammann grating.

12. *(Original)* The optical inspection system as set forth in claim 9, further comprising:

an objective lens focusing the multiple beams at a target; and  
a detector receiving light returned from the target, through the objective lens  
wherein the detector includes a multiple line CCD camera, and wherein each of the multiple annular beams is received on a separate one of the lines of the multiple line CCD camera.

13. *(Original)* An optical inspection system, comprising:  
a light source outputting a beam; and  
a scanner scanning the beam in a beam spot across a target, the target being movable in a target movement direction;

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)  
**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/784,771

wherein the beam has a scanning direction not perpendicular to the target movement direction.

14. *(Currently Amended)* The optical inspection system as set forth in claim 13, ~~wherein the beam spot travels a distance in the mechanical scanning direction that is greater than the distance in between scan lines in the mechanical scanning direction~~ further comprising a beam splitter operating on said beam to produce at least one additional beam, wherein said scanner scans the additional beam in a direction not perpendicular to the target movement direction.

15. *(Currently Amended)* An optical inspection system, comprising:  
a light source outputting a beam;  
a beam splitter receiving the beam and producing therefrom a plurality of beams;  
a scanner scanning the plurality of beams;  
a confocal optical arrangement comprising a pinhole; and  
optics for focusing the plurality of beams at a target and directing captured light to a detector through the confocal optical arrangement.

16. *(Currently Amended)* The optical inspection system as set forth in claim 15, ~~further comprising a control unit controlling the focus of the optics based on:~~  
~~a light level threshold; and~~

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)  
**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/784,771

~~a light level signal indicative of light received by the detector through the confocal optical arrangement~~  
plurality of light detection elements, each corresponding to one of said plurality of beams.

17. *(Canceled)*

18. *(Original)* An optical inspection system, comprising:

a light source providing a beam of light through a pupil;

a multiple beam splitter receiving the light through the pupil;

a scanner receiving the multiple beams and providing scanned multiple beams;

a beam splitter receiving the scanned multiple beams and illuminating a target through an objective lens;

the objective lens collecting light returned back from the illuminated target and passing the collected light through the beam splitter to an imaging lens;

the imaging lens receiving the light passing through the beam splitter and focusing the light to a bright field channel detector.

19. *(Currently Amended)* The optical inspection system as set forth in claim 18, wherein the bright field channel detector includes a multiple line CCD camera, and wherein each of the multiple ~~annular~~ beams is received on a separate one of the lines of the multiple line CCD camera.

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)  
**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/784,771

20. (*Currently Amended*) The optical inspection system as set forth in claim 18,  
further comprising:

an other beam splitter optically disposed between the imaging lens and the bright field  
channel detector; and

the light from the imaging lens ~~passing through~~ deflected by the other beam splitter being  
focused ~~also~~ on a dark field channel detector.

21. (*Original*) The optical inspection system as set forth in claim 20, wherein at least  
one of the bright field channel detector and the dark field channel detector includes a multiple  
line CCD camera, and wherein each of the multiple annular beams is received on a separate one  
of the lines of the multiple line CCD camera.

22. (*Original*) An optical inspection system, comprising:  
a light source providing a beam of light;  
a scanner receiving the light through a first beam splitter and providing scanned light;  
a second beam splitter receiving the scanned light through a scan lens, and illuminating a  
target through an objective lens;

the objective lens collecting light returned back from the illuminated target and passing  
the collected light to the second beam splitter;

the second beam splitter providing part of the collected light, as a returned light signal,  
back through the scan lens and scanner to the first beam splitter;

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)  
**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/784,771

the first beam splitter deflecting the returned light signal through a focusing lens and a pinhole; and

one or more detectors receiving the light through the pinhole.

23. *(Original)* The optical inspection system as set forth in claim 22, wherein:

the light source provides the beam of light through a pupil;

a multiple beam splitter receives the light through the pupil;

the light received by the scanner includes multiple beams provided by the multiple beam splitter, and the light scanned by the scanner includes multiple scanned beams;

the second beam splitter provides part of the collected light through an imaging lens to a bright field channel detector.

24. *(Original)* The optical inspection system as set forth in claim 23, wherein the bright field channel detector includes a multiple line CCD camera, and wherein each of the multiple annular beams is received on a separate one of the lines of the multiple line CCD camera.

25. *(Original)* The optical inspection system as set forth in claim 23, further comprising:

a third beam splitter optically disposed between the imaging lens and the bright field channel detector; and

the light from the imaging lens passing through the third beam splitter being focused also on a dark field channel detector.

Atty. Docket No. 006629 USA D 01/PDC/WF/OR (Q77224)

**PATENT APPLICATION**

AMENDMENT UNDER 37 C.F.R. § 1.111

U.S. Application No. 10/784,771

26. *(Original)* The optical inspection system as set forth in claim 25, wherein the multiple scanned beams are annular beams.

27. *(Original)* The optical inspection system as set forth in claim 25, wherein at least one of the bright field channel detector and the dark field channel detector includes a multiple line CCD camera, and wherein each of the multiple annular beams is received on a separate one of the lines of the multiple line CCD camera.

28. *(Original)* The optical inspection system as set forth in claim 23, wherein the multiple beam splitter produces the multiple beams with a diffractive optical element having uniform diffraction efficiency.

29. *(Original)* The optical inspection system as set forth in claim 28, wherein the diffractive optical element is a Dammann grating.

30. *(Original)* The optical inspection system as set forth in claim 22, wherein:  
the target is movable in a target movement direction; and  
the scanner scans with a scanning direction not perpendicular to the target movement direction.

31-59. *(Canceled)*